

Appendix 2:

```
ACTIVE_SPEECH_MODE_SET = (LOW_MODE, ..., HIGH_MODE)
NUMBER_OF_ACTIVE_SPEECH_MODES = n
LOW_MODE = ACTIVE_SPEECH_MODE_SET(1)
HIGH_MODE = ACTIVE_SPEECH_MODE_SET(n)

IF n is even
    → MIDDLE_MODE = ACTIVE_SPEECH_MODE_SET(n/2)
IF n is odd
    → MIDDLE_MODE = ACTIVE_SPEECH_MODE_SET((n+1)/2)
IF n is 2
    → MIDDLE_MODE = LOW_MODE

/* Used thresholds are adaptive based on background noise and speech power level */
LEVEL_FACTOR = function(speech level)
NOISE_FACTOR = function(noise level)
|
LOW_GAIN_THRESHOLD = function(LEVEL_FACTOR, NOISE_FACTOR, fixed codebook gain,
ACTIVE_SPEECH_MODE_SET)
HIGH_GAIN_THRESHOLD = function(LEVEL_FACTOR, NOISE_FACTOR, fixed codebook gain,
ACTIVE_SPEECH_MODE_SET)

/* Source adaptation for active speech */
IF mode is not DTX_MODE
    /*Low energy sequence*/
    IF last fixed codebook gain is smaller than LOW_GAIN_THRESHOLD
        → mode is LOW_MODE
    /*Transient*/
    ELSE IF zero cross variation is NONSTATIONARY
        → mode is HIGH_MODE
    /* Voiced with low frequencies*/
    ELSE IF zero cross variation is STATIONARY & last zero cross is LOW
        → mode = MIDDLE_MODE
    /*Voiced*/
    ELSE IF (LOW < last zero cross < HIGH)
        IF last fixed codebook gain is larger than HIGH_GAIN_THRESHOLD
            mode = HIGH_MODE
        ELSE
            mode = MIDDLE_MODE
    /* Unvoiced */
    ELSE IF last zero cross is HIGH
        → mode = HIGH_MODE
    /* Just code... */
    ELSE
        mode = MIDDLE_MODE
```